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A Comparison of Two Joint Protection Educational Methods and their Effects on
Implementation of Recommendations

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Abstract

The current study is part of a larger study investigating two joint protection patient educational methods and their effects on knowledge of joint protection principles, ability to generalize joint protection techniques to new tasks, and the number of occupational therapist recommendations incorporated into the home. The purpose of this study was to investigate whether there is a difference in the number of recommendations incorporated into the home based on method of joint protection patient education. The role of pain and its relationship to the number of recommendations incorporated into the home was also examined. Participants were randomly assigned to either a standard treatment group, which received verbal teaching and demonstration of joint protection techniques, or an experimental treatment group, which received verbal teaching, demonstration, and active practice of joint protection techniques. Each participant received a follow-up telephone interview two to four weeks post discharge from occupational therapy services. A two-tailed Pearson Chi-square test showed no statistically significant differences between groups in the degree to which recommendations regarding bathing, grooming, cooking, and hand activities were implemented into the home. However, the same test confirmed that significantly more participants in the experimental group than the standard group implemented dressing recommendations into the home. A Spearman correlation showed no relationship between the perceived interference of pain at follow-up and the degree to which recommendations regarding bathing, grooming, dressing, cooking, and hand activities were implemented into the home. Results of this study concluded that there is a difference between joint protection educational methods in terms of the number of dressing recommendations, but not other types of recommendations, that are incorporated into the home.

A Comparison of Two Joint Protection Educational Methods and their Effects on Implementation of Recommendations

Arthritis, including rheumatoid arthritis, osteoarthritis, and other forms, is one of the most prevalent chronic health problems in the United States, and is the nation's leading cause of disability among Americans over the age of 15 (Arthritis Foundation, 2004). Many individuals who are diagnosed with arthritis are also being referred to occupational therapy to learn principles that will help them to enhance daily functioning. To decrease the amount of stress on the body, occupational therapists are teaching protective techniques, such as joint protection (Hammond & Lincoln, 1999b). Because joint protection techniques are frequently taught in occupational therapy, it is important to investigate the effectiveness of specific methods of patient education on compliance with recommendations from the occupational therapist, and how the experience of pain affects patients' level of compliance. Research in this area can add to occupational therapists' understanding of how different methods of patient education and the amount of pain a patient is experiencing influence the level of compliance with therapist recommendations. Therefore, the purposes of this study are to examine the effects of two different methods of patient education on the number of therapist recommendations incorporated into the home, and how pain may be related to compliance with those recommendations.

Scope of Arthritis

Arthritis is a chronic condition of the joints caused by joint disease or direct trauma to bone and soft tissue, usually resulting in pain, loss of motion at the joints, deformity, and associated functional deficits (Spencer, 2003). Rheumatoid arthritis (RA), is a progressive, systemic disease characterized by remissions and exacerbations of destructive inflammation of connective tissue, especially synovial membranes in synovial joints. In RA, two or more joints

are usually affected at one time and deformities, such as swan-neck deformities, boutonniere deformities, thumb deformities, ulnar deviations, and volar subluxations, are common.

Osteoarthritis (OA), the most prevalent form of arthritis, is a slowly progressive, degenerative joint disease that affects the joints of the fingers, elbows, hips, knees, and ankles. Osteoarthritis is characterized by degeneration of the articular cartilage and swelling in joints, most often affecting the weight bearing joints. Rheumatoid arthritis and osteoarthritis are two of more than 100 different forms of arthritis.

Because arthritis can affect all joints of the body, persons with arthritis may develop difficulties in basic occupations of daily living (ODLs), such as bathing, grooming, dressing, feeding, and toileting, as well as instrumental occupations of daily living (IODLs), such as home management, care of others, and job performance. Due to changes in sensation, range of motion, and strength associated with arthritis, decreased comfort, speed of movement, and endurance in ODLs may result (Spencer, 2003). Certain IODLs may exacerbate the pain associated with arthritis by requiring repetitive motions or prolonged resistive force of movement without rest. Pain, whether intermittent or chronic, can be a major problem for individuals with arthritis and can temporarily or permanently limit physical function needed for the completion of everyday occupations. During this time, joint protection is essential.

Education of Joint Protection Principles

The purposes of teaching joint protection techniques are to help patients preserve the integrity of their joint structures, relieve joint pain during occupations, and decrease the amount of stress on the body as a whole. Specific joint protection principles include avoiding positions of deformity, using stronger, larger joints, using joints in their most stable and functional

positions, reducing the force and effort required to perform tasks, and distributing the load of objects over as many joints as possible (Hammond & Lincoln, 1999a).

In a single-blind crossover trial investigating whether occupational therapists, following a two-day educational-behavioral training course, could enable individuals with RA to improve their use of joint protection techniques, it was found that the median baseline Joint Protection Behavior Assessment (JPBA) score for all participants rose significantly six months following a joint protection program (Hammond, Jeffreson, Jones, Gallagher, & Jones, 2002). Of the 20 tasks on the JPBA, 14 tasks were performed with significantly greater use of joint protection methods. The authors also found that higher baseline overall pain and higher baseline hand pain correlated with greater increases in immediate post-education JPBA scores. The results of this study indicate that a two-day educational-behavioral training course assisted occupational therapists in enabling individuals to improve their use of joint protection techniques.

In a pilot study investigating whether RA patients' hand movement patterns changed following a joint protection education program (Hammond, 1994), no significant behavioral change following a joint protection education program was found. However, during a follow-up interview regarding self-perceived joint protection behavior and relevance of joint protection education, all patients stated that they paid more attention to joint care post education. These findings may suggest that this method of joint protection education leads to an attitudinal change, but not a behavioral change. In Hammond's study, only hand pain correlated with initial use of joint protection techniques, possibly indicating that patients with little hand pain at the time of education may need greater input to facilitate behavioral change.

Using a similar method of joint protection education, a study by Hammond and Lincoln (1999b) investigated the effects of joint protection education on improving adherence with joint

protection techniques by people with RA. Results of this study showed no significant difference in scores between baseline and 12 weeks post joint protection education and no significant differences were found in hand pain before and after education. However, a significant increase in joint protection knowledge scores from baseline to 12 weeks post education was found. Similar to the Hammond (1994) study mentioned previously, the results of this study concluded that joint protection education improved knowledge of joint protection techniques, but did not seem to improve use of these techniques.

Using a single-blind crossover trial design, Hammond, Lincoln, and Sutcliffe (1999) investigated whether adherence with joint protection techniques could be increased following a group joint protection education program. The joint protection education program consisted of four two-hour sessions per week, plus an optional home visit within two weeks of the completion of the program. During the program, patients were provided with a workbook and patient education brochures. A significant increase was found in participants' JPBA scores at both of two post-education assessments. A significant increase was also found in the amount of participants' self-reported joint protection practice at home post-education. This study suggests that educational behavioral methods of patient education should be more widely used in clinical practice.

Principles of Occupational Therapy

An important principle in occupational therapy is purposeful occupation. Purposeful occupations have personal meaning combined with a goal-directed quality and, therapeutically, are used to evaluate, facilitate, restore, or maintain an individual's abilities to engage in occupations (American Occupational Therapy Association, 2004). Another important principle of occupational therapy is learning by doing. John Dewey (1916), a philosopher and educator,

advocated the use of “active occupations” as the best means for promoting learning and education. Dewey’s thoughts concerning occupation and learning influenced the founders of occupational therapy, who were attempting to use active occupations as a way to help improve the quality of life of people with disabilities. A growing body of research is being conducted on different methods of learning, including “hands-on,” or purposeful occupation.

In a simple experiment, Hartman, Kopp Miller, and Nelson (2000) investigated whether children who engaged in hands-on learning would be able to recall more of the steps and more of the correct order of the steps of an occupation than children who engaged in a demonstration teaching method. The results of this study indicated that hands-on occupation led to significantly more recall than the demonstration condition. This study contributes to the establishment of a valid base of research supporting the principle of hands-on learning.

Eakman and Nelson (2001) used a meatball making occupation to investigate the effects of hands-on occupation versus verbal training only on immediate memory recall in men with traumatic brain injuries. The results of their study confirmed that the hands-on group had significantly more memory recall than the verbal instruction only group. Results of this study emphasize the importance of naturalistic occupational forms in the practice of occupational therapy.

Kluczynski (2002) investigated the effects of hands-on versus demonstration teaching methods on memory recall in older adults using an ice cream making occupation. In her study, Kluczynski compared the effects of these teaching methods on immediate, short-term, and long-term memory recall. Results of this study indicate no statistically significant differences between the two teaching methods in terms of immediate recall, short-term recall, or long-term recall.

In a similar study, Hearn (2000) investigated the effects of hands-on demonstration versus verbal demonstration on memory recall in college students using a no-bake cookie occupation. This study also compared the effects of each teaching method on immediate, short-term, and long-term memory recall. Results indicated no statistical difference between the two conditions in terms of immediate or short-term memory recall, but did indicate a statistical difference between the two conditions in terms of long-term memory recall. These results suggest that when developing learning situations for a patient, therapists should keep the patient actively involved in the learning process to ensure memory recall over time.

Compliance with Patient Education Principles

Compliance, or adherence, with medical advice may occur or not occur due to several variables. For example, some psychological factors, such as self-efficacy, may increase compliance with patient education principles, while some environmental factors, such as time constraints, may decrease compliance. Research on compliance has been conducted in many areas of healthcare.

So, Umraw, Scott, Campbell, Musgrave, and Cartotto (2003) investigated whether enhanced patient education increases compliance with silicone gel sheeting on hypertrophic scars. In this study, participants were randomized to either a conventional education group or an enhanced education group. Participants in the conventional education group received routine instruction on the use of silicone gel sheeting, while participants in the enhanced education group received routine instruction, as well as a handout and video. Participants in the enhanced education group wore silicone gel sheeting significantly longer than participants in the conventional education group. The results of this study concluded that detailed multimedia patient education improves compliance with silicone gel sheeting.

Cumming, Thomas, Szonyi, Frampton, Salkeld, and Clemson (2001) investigated adherence to home modification recommendations made by an occupational therapist using a randomized clinical trial. Adherence with home modification recommendations was assessed one year following initial home visits. Of 419 recommended home modifications, partial or complete adherence was demonstrated with 216 (52%) of those recommendations. A belief that home modification could prevent falls and having help at home from relatives were the only significant predictors of adherence to therapist recommendations in this study. The results of this study conclude that a major barrier to adherence to home modification recommendations is that many older adults do not believe that home modifications can reduce their risk of having a fall.

Levels of adherence to joint protection techniques reported by patients six months following occupational therapy intervention, which included joint protection advice, and the factors that patients identify as affecting this adherence were investigated in a retrospective study conducted by Williams and Adams (2000). All respondents who had been taught how to care for their joints and minimize joint strain reported adhering to joint protection techniques every day. When asked how often joint protection techniques were used, three of the respondents stated that they used them for every task and 16 stated that they used them for most tasks. The researchers found that positive influencing factors for practicing joint protection techniques included pain relief, improved symptoms, and perceived benefits, while negative influencing factors included time constraints, lack of social support, difficulty in making behavioral changes, and perceived lack of benefits.

The Current Study

The current study is part of a larger study investigating the effects of two, joint protection patient educational methods and their effects on knowledge of joint protection principles, ability to generalize joint protection techniques to new tasks, and the number of occupational therapist recommendations incorporated into the home. Whether the amount of pain experienced is related to adherence to therapist recommendations will also be investigated. One method of patient education will include verbal teaching and demonstration of joint protection techniques, while the second method of patient education will include verbal teaching and demonstration, as well as active practice of joint protection techniques. The purpose of this study was to investigate whether there is a difference in the number of recommendations incorporated into the home based on method of joint protection patient education. The role of pain and its relationship to the number of recommendations incorporated into the home was also examined. Upon comparison of the standard treatment group (verbal teaching and demonstration of joint protection techniques) and the experimental treatment group (verbal teaching, demonstration, and active practice of joint protection techniques), it was hypothesized that, 1) to those participants for whom recommendations were made, there would be a difference between joint protection patient educational methods in the degree to which participants implemented recommendations in the home, and 2) there would be a relationship between the perceived interference of pain at follow-up and the degree to which recommendations were implemented in the home.

Methods

Participants

The participants in this study included 42 adults (five men and 37 women) who received occupational therapy services from The Toledo Hospital's Arthritis and Osteoporosis Center. The mean age of all participants was 59.9 years, with a standard deviation of 11.2. Thirty-two participants considered themselves to be white or of Caucasian descent, eight participants considered themselves to be black or of African American descent, one participant considered him or herself to be of Hispanic or Latino descent, and one participant chose not to report his or her race. A flyer was posted in the waiting area at The Toledo Hospital's Arthritis and Osteoporosis Center to help recruit participants (See Appendix A). To be included in this study, participants were to be diagnosed with arthritis that affected their hands. In addition, joint protection education was to be part of each participant's occupational therapy plan of treatment. Participants were to be at least 18 years of age, demonstrate the ability to speak and understand English, and present no deficits in cognitive ability that would hinder understanding of patient education content. To conduct a follow-up interview, it was necessary to also collect each participant's name and telephone number.

Study Design

The design for this study was a simple experiment. Participants were randomly assigned to a standard treatment group, which included verbal teaching and demonstration of joint protection techniques, or an experimental treatment group, which included verbal teaching, demonstration, and active practice of joint protection techniques.

A simple experimental design was chosen for this study in order to address a possible cause-and-effect relationship. A pretest-posttest experimental design was not chosen because it

was anticipated that pre-testing sensitivity might influence participants' scores and responses regarding joint protection techniques.

Instruments & Measures

Prior to initial evaluation, participants completed the SF-36v2 Health Survey (Ware, 2000) or the Modified SF-36v2 Health Survey, as well as the Total Rehab Patient Intake form. The SF-36v2 Health Survey includes questions regarding participants' general physical health, current, recent, and past occupational function, pain, and interference of pain on occupational function (See Appendix B). The Modified SF-36 (See Appendix C) consists of two questions regarding pain taken from the original SF-36v2. The Total Rehab Patient Intake form, a facility-specific internal document (See Appendix D), includes questions regarding therapy referral information, medical history, pain history, social/work history, functional status, living environment, learning style, therapeutic goals, and economic, religious, and cultural backgrounds that may affect care.

Another form was provided for the occupational therapist to document each participant's occupational performance on three generalization tasks. More information regarding this form and the generalization tasks can be found in the manuscript of the related study.

Procedures

As previously stated, participants completed the SF-36v2 Health Survey (or the Modified SF-36v2 Health Survey) and the Total Rehab Patient Intake form upon admission to therapy. The occupational therapist began occupational therapy services, including an initial evaluation and patient education regarding disease process, medications, and therapy procedures. Following the initial evaluation, the occupational therapist proceeded with informed consent if the patient met the inclusion criteria requirements. Then, using a computer generated, random

number sequence, participants were randomly assigned to a standard treatment group or an experimental treatment group.

The standard treatment group received verbal teaching and demonstration while the experimental treatment group received verbal teaching, demonstration, and active practice of joint protection techniques. Specific joint protection principles include avoiding positions of deformity, using stronger, larger joints, using joints in their most stable and functional positions, reducing the force and effort required to perform tasks, and distributing the load of objects over as many joints as possible (Hammond & Lincoln, 1999a). The occupational therapist made recommendations to each participant. All recommendations were based on each individual participant's problem areas or areas of concern. Recommendations could be made in a maximum of 14 occupational categories. These categories included bathing, grooming, toileting, dressing, eating, cooking, laundry, cleaning, transportation, childcare, pet care, yard work, leisure, and hand activities (e.g., such as writing, using scissors, turning lamp switches, opening mail, opening medicine bottles, turning doorknobs, and holding books or newspapers). Occupations used to teach, demonstrate, and/or practice joint protection techniques included squeezing toothpaste tubes or lotion bottles, opening jars, pushing buttons on a microwave, turning keys, cooking, turning lamp switches, using scissors, opening mail, turning door knobs, opening medicine bottles, wringing out washcloths or sponges, opening food packages, and doing laundry. All teaching occupations were individualized for each participant. For example, if only three problem areas were identified from the above occupations, those three areas were the only areas focused on in therapy. Similarly, if there were additional occupations that were relevant in the participant's life but were not listed in the above occupations, joint protection techniques regarding those occupations were also included as a part of therapy.

On the last therapy session, participants' ability to generalize joint protection techniques was tested using occupations that were not addressed during intervention. Information regarding this test and the generalization tasks can be found in the manuscript of the related study.

Two to four weeks post discharge from occupational therapy services, each participant received a follow-up interview via telephone. The first portion of this interview included questions regarding the number of therapist's recommendations incorporated into the participant's home. Information regarding the number and type (i.e. structural or behavioral modifications) of recommendations provided by the therapist was descriptively documented for each participant. Participants were first asked whether or not they implemented a particular recommendation. If the response was "Yes," the participant was then asked how fully he or she implemented that recommendation, with "all of the time," "most of the time," or "some of the time" being possible answers. If the participant's response was "No," he or she was then asked to briefly discuss why the recommendation was not implemented.

Recommendations were specific to each participant. For example, one participant may have received 12 recommendations including home and job-specific techniques; whereas, another participant may have received seven recommendations specifically targeting home modifications. In the second portion of this interview, participants were asked questions taken from the Joint Protection Knowledge Assessment (JPKA) (Hammond & Lincoln, 1999b), as this data was needed for the related study.

Data Analysis

Because the recommendation implementation and perceived interference of pain ratings are ordinal in nature, and because there are two conditions to the independent variable in this study, Pearson Chi-square tests, with an alpha level of .05, were performed. Data from

participants who did not complete all occupational therapy treatment sessions were not included in data analysis. Cramer's statistic was used to determine the effect sizes for the dependent variable of the degree to which recommendations were implemented in this study.

Results

Data analysis was based on the results of 42 participants, with 23 participants (two men and 21 women) receiving the standard condition, and 19 participants (three men and 16 women) receiving the experimental condition. There were no differences between groups in terms of age, sex, or race. Participants in the standard group had a mean age of 59.0 years with a standard deviation of 9.5, while participants in the experimental group had a mean age of 60.7 years with a standard deviation of 13.0. Lastly, 16 Caucasian participants, six African American participants, and 1 Hispanic participant were in the standard group, while 16 Caucasian participants and two African American participants were in the experimental group.

Because occupational therapy treatments were individualized for each participant, all participants did not receive the same therapy recommendations. Data analyses were not completed for recommendations made to fewer than 80 percent of participants. Eighty-one percent of participants received recommendations in the area of bathing, 95.2 percent in the area of grooming, 57.1 percent in the area of toileting, 95.2 percent in the area of dressing, 78.6 percent in the area of eating, 97.6 percent in the area of cooking, 52.4 percent in the area of laundry, 78.6 percent in the area of cleaning, 69 percent in the area of transportation, 92.9 percent in the area of hand activities, 19 percent in the area of childcare, 19 percent in the area of pet care, 47.6 percent in the area of yard work, and 47.6 percent in the area of leisure.

Descriptive data for each of the recommendation categories was calculated for both of the independent variables. Please refer to Table 1 to see the overall distribution of recommendation implementation between groups.

Hypothesis Testing

It was hypothesized that to those participants to whom a recommendation was made, there would be a difference between joint protection patient educational methods in the degree to which participants implemented recommendations in the home. A two-tailed Pearson Chi-square test showed no statistically significant differences between groups in the degree to which recommendations regarding bathing, grooming, cooking, and hand activities were implemented into the home (See Table 2). However, the same test confirmed that there was a statistically significant difference between groups in the degree to which recommendations regarding dressing were implemented into the home, with more participants in the experimental group than the standard group implementing this recommendation (See Table 2).

It was also hypothesized that there would be a relationship between the perceived interference of pain at follow-up and the degree to which recommendations were implemented in the home. A Spearman correlation showed no significant relationship between the perceived interference of pain at follow-up and the degree to which recommendations regarding bathing, grooming, dressing, cooking, and hand activities were implemented into the home (See Table 3).

Effect Size Testing

Effect sizes were calculated for recommendations that were made to at least 80 percent of participants. As described by Rea and Parker (1992), if the value of Cramer's V is .00, but less than .10, there is a negligible association; if the value of Cramer's V is .10, but less than .20, there is a weak association; if the value of Cramer's V is .20, but less than .40, there is a

moderate association; if the value of Cramer's V is .40, but less than .60, there is a relatively strong association; if the value of Cramer's V is .60, but less than .80, there is a strong association; and if the value of Cramer's V is .80 to 1.00, there is a very strong association. According to Cramer's Statistic, moderate associations were found for recommendations made regarding grooming and cooking and a negligible association was found for recommendations made regarding hand activities (See Table 4). However, Cramer's statistic confirmed relatively strong associations for recommendations made regarding bathing and dressing (See Table 4).

Discussion

The purpose of this study was to investigate two joint protection patient educational methods and their effects on the number of occupational therapist recommendations incorporated into the home. The role of pain and its relationship to the number of recommendations incorporated into the home was also examined.

It was hypothesized that for participants to whom a recommendation was made, there would be a difference between joint protection educational methods in the degree to which participants implemented recommendations in the home. The results of this study only partially support this hypothesis. For recommendations regarding dressing, a statistically significant difference between groups was confirmed. However, statistically significant differences were not found for recommendations regarding bathing, grooming, cooking, or hand activities. When looking at the data regarding dressing recommendations, more participants in the standard group than the experimental group answered, "No" when asked if they implemented this recommendation at home. Nine of the 23 participants in the standard group answered, "No" while only two of the 17 participants in the experimental group answered, "No." In regard to bathing, grooming, cooking, and hand activity recommendations, responses were more evenly

distributed in number of responses between groups. This could mean that additional opportunities for hands-on practice makes more of a difference in regard to dressing than other areas of daily life, in terms of recommendations implemented into the home.

It is also possible that a significant difference in implementation of dressing recommendations was found between groups by chance, or because of a type I error. There is always a chance of a type I error in any study design (Nelson, 2004). One potential source of type I error is the influence of repeated testing on the dependent variable. Because several analyses were performed in this study, it is possible that a significant difference in dressing was found due to a type I error.

The majority of the results of this study are similar to that of Hammond and Lincoln (1999b) in which no significant results were found regarding joint protection education on improving adherence with joint protection principles. Hammond and Lincoln (1999b) conducted the Joint Protection Behaviour Assessment (JPBA) six weeks and one week before joint protection education and six and 12 weeks after education. Results found no significant changes in JPBA scores during the control phase before education, and no significant differences were found in scores between baseline and 12 weeks after education. This study did find, however, a significant increase in joint protection knowledge scores from baseline to 12 weeks after education. This could mean that education helped participants become more aware of their actions, but did not help them change their actions, in terms of using joint protection principles.

The results of this study do not, however, agree with the results of previous research by So, Umraw, Scott, Campbell, Musgrave, and Cartotto (2003). One of the purposes of So et al's study was to determine whether enhanced patient education increases compliance with silicone gel sheeting on hypertrophic scars. Results indicated that detailed multimedia patient education

improves compliance with silicone gel sheeting on hypertrophic scars. Although this study and the current study are based on very different dependent variables, patient educational methods are still a very important part of both studies. In So et al's study, a relationship was found between enhanced patient educational methods and compliance, whereas, an overall significant difference was not found in the current study.

In this study, it was also hypothesized that there would be a relationship between the perceived interference of pain at follow-up and the degree to which recommendations would be implemented in the home. The results of this study did not support this hypothesis. Similarly, Hammond and Lincoln (1999b) also found no significant differences in perception of hand pain before and 12 weeks after joint protection education.

The sample size for this study was rather small, and a relatively strong association was found in terms of effect size for recommendations made regarding bathing. Because the effect size was fairly large for this recommendation, it is possible that a larger sample size would have resulted in finding significant differences. Again, because the sample size in this study was small, it was possible that a type II error was made and a relationship does exist between joint protection educational methods and the implementation of recommendations into the home.

It is possible that the conditions of the independent variable in this study were too similar. Although participants in the experimental group were able to practice joint protection techniques, more practice time may have been necessary for results to be significant. The intensity of the experience of practice may not have been strong enough. For example, participants in the experimental group were able to look at, hold, simulate, etc. the use of a large grip utensils during their therapy session(s). However, if those participants would have been able to take those utensils home and use them while eating or cooking, results may have been significantly

different. It would also be reasonable to test the effect of adding an occupation completed in the clinic that required typical use of the desired utensils.

In regard to the instrument used to rate implementation of recommendations, the instrument used may not have been sensitive enough to detect true differences that may have existed. A four point scale was used for participants to rate implementation of recommendations. It is possible that a scale with more gradations, such as a seven or ten point scale, would have been more effective. Also, the rating scale used in this study used categorical gradations, such as “some of the time,” or “most of the time.” It is possible that use of a scale with numerical gradations for rating the degree to which recommendations are implemented may be more effective.

Implications for Occupational Therapy

Although the first hypothesis was not fully supported by this study, the partial support of this hypothesis still has important implications for occupational therapy. It is important to note that there was a statistically significant difference between joint protection educational methods in regard to the number of dressing recommendations incorporated into the home. Although differences were not found between groups for other recommendations, it is important to consider this type of educational method when making recommendations regarding dressing specifically.

The results of this study demonstrated no real relationship between perception of pain and the degree to which recommendations were implemented. This result is very important for clinical occupational therapists. It is commonly believed by many therapists that if a patient or client is experiencing pain, he or she will implement more joint protection principles in the home than if he or she is not experiencing pain. The results of this study do not support this belief. If

pain is not an underlying factor in why patients or clients implement joint protection principles, more research needs to be completed to investigate other possibly underlying influences for implementation of joint protection techniques.

Limitations

There were several limitations to this study. First, the sample size was rather small. It is possible that more differences would have been found between groups if the sample size would have been larger. Also, the sample of participants was predominantly of Caucasian descent and female. Because of this, it is difficult to generalize the results of this study to other populations. As previously discussed, it is also possible that the conditions to the independent variable in this study were too similar, and, in regard to implementation of recommendations, the instruments used may not have been sensitive enough.

Future Research

It is important to continue research in this area. For replication of this study to be successful, it is recommended that a larger sample size be obtained, as well as a more homogenous sample. Other populations should also be explored. Because past research found significant results in terms of compliance with therapist recommendations and this study did not, it is important to continue to explore this area.

Future studies should also address problems or potential problems found in this study. For example, in future studies, researchers should ensure that the conditions of the independent variable are more distinctly different, as it was possible in this study that the conditions of the independent variable were too similar to one another. Also, future research should look closely at instruments used to rate the degree of implementation of recommendations. This study used a

four-point ordinal scale which may have lacked sensitivity needed to detect subtle differences in behavior. Future studies may want to consider using an instrument that is more sensitive.

Conclusions

The purpose of this study was to investigate whether there is a difference in the number of recommendations incorporated into the home based on method of joint protection patient education. The role of pain and its relationship to the number of recommendations incorporated into the home was also examined. No statistically significant differences were found between groups in the degree to which recommendations regarding bathing, grooming, cooking, and hand activities were implemented into the home. However, a statistically significant difference was confirmed between groups in the degree to which recommendations regarding dressing were implemented into the home, with more participants in the experimental group than the standard group implementing this recommendation. No significant relationship between the perceived interference of pain at follow-up and the degree to which recommendations regarding bathing, grooming, dressing, cooking, and hand activities were implemented into the home. Additional research is needed to further investigate this topic and to address problems or potential problems found in this study. Future research should look closely at instruments used to rate the degree of implementation of recommendations, as well as ensuring distinct differences between the independent variables.

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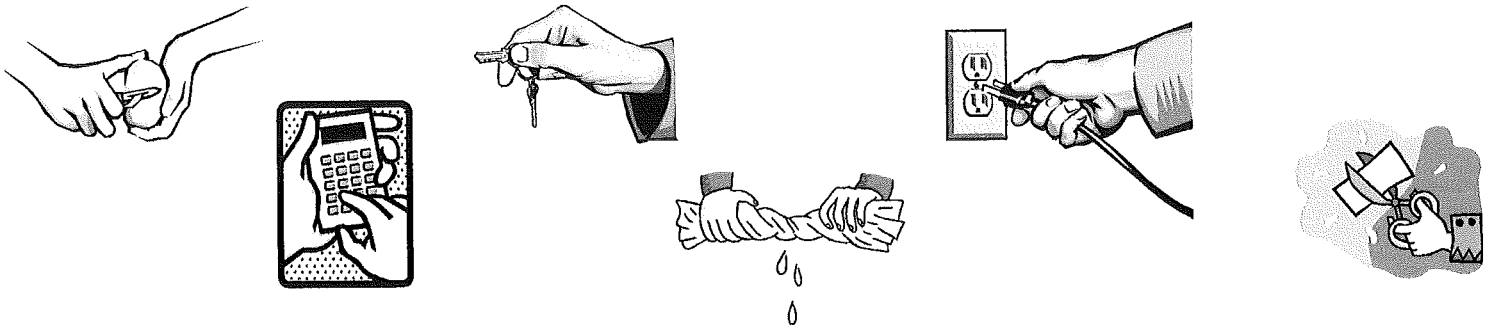
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Appendix A

Do you want to help your patients?

Do your patients have arthritis?



The Arthritis and Osteoporosis Center and the Medical University of Ohio are teaming up to investigate the effects of joint protection educational methods on individuals who have arthritis affecting the hands.

If referred, the research study will be a part of regular occupational therapy treatment. No patient will be denied occupational therapy services as a part of the study. In appreciation of participation, patients will receive a \$10 gift certificate upon completion of the study.



4. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. Cut down on the amount of time you spent on work or other activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Accomplished less than you would like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Were limited in the kind of work or other activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Had difficulty performing the work or other activities (for example, it took extra effort)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. Cut down on the amount of time you spent on work or other activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Accomplished less than you would like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Did work or other activities less carefully than usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

Not at all	Slightly	Moderately	Quite a bit	Extremely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. How much bodily pain have you had during the past 4 weeks?

None	Very mild	Mild	Moderate	Severe	Very severe
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Today's Date: / / MRN:



9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks...

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. did you feel full of life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. have you been very nervous?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. have you felt so down in the dumps nothing could cheer you up?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. have you felt calm and peaceful?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. did you have a lot of energy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. have you felt downhearted and depressed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. did you feel worn out?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. have you been happy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. did you feel tired?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. How TRUE or FALSE is each of the following statements for you?

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I am as healthy as anybody I know	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I expect my health to get worse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. My health is excellent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you for completing this survey.

STAFF USE ONLY

GENDER	TIMEFRAME	AGE	MRN
<input type="radio"/> Male	<input type="radio"/> Pre Survey	<input type="text"/>	<input type="text"/>
<input type="radio"/> Female	<input type="radio"/> Post Survey	<input type="text"/>	<input type="text"/>

Appendix C

Modified SF-36v2 Health Survey

1. How much bodily pain have you had during the **past 4 weeks**?
 - a. None
 - b. Very mild
 - c. Mild
 - d. Moderate
 - e. Severe
 - f. Very severe

2. During the **past 4 weeks**, how much did pain interfere with your normal work (including both work outside the home and housework)?
 - a. Not at all
 - b. A little bit
 - c. Moderately
 - d. Quite a bit
 - e. Extremely

* Taken from SF-36v2 Health Survey[®] copyright 2000.

Researcher Use Only

- Intake
- Follow-up

Appendix D

Total Rehab Patient Intake

Therapy Referral Information

List current problem that brought you to therapy: _____

Area(s) Affected: _____

When Occurred: _____ How Occurred: _____

Has this occurred before? Yes No When?: _____ How: _____

Special tests for current problem: X-Ray MRI Other: _____

Surgery patients only: Date of surgery for current problem: _____

Have you previously had therapy or other treatment for current problem? No Yes Explain: _____

Have you used a brace, splint, etc: Yes No Are you sensitive to heat or cold? Yes No

Please rate your health status: Excellent Good Fair Poor

Medical History: Please check if you have had any of the following:

Heart Prob. Asthma Thyroid Depression/mental Pacemaker

Stroke Epilepsy Diabetes Weight gain/loss Lymphodema

Arthritis Cancer Hi/Low BP Bipolar/ADHD Recent surgery

Osteoporosis Recent Pregnancy Change bowe/bladder function Other: _____

List Known Allergies: None Latex Cortisone Bee stings Tape Other: _____

List current medications taking or Check box if list provided None: _____

Are you taking Coumadin or other blood thinner? Yes No Do you smoke: Yes No

Do you usually exercise/work out beyond normal daily activity Yes No

Are you: Right Handed Left Handed Use Both Easily

Social/Work History

Are you currently working? Yes No Student If yes: Regular Duty Light Duty

List employer/work site: _____ Occupation: _____

List last date worked: _____ If off work: list return to work date: Unknown : _____

Job duties: Sit Stand Reach Lift Repetitive Fingering/Handling Other _____

Indicate maximum lifting requirements: _____

Please describe your living environment

Number of floors in home <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	Stairs outside home? <input type="checkbox"/> Yes <input type="checkbox"/> No	Live: <input type="checkbox"/> Alone <input type="checkbox"/> With spouse <input type="checkbox"/> With Family <input type="checkbox"/> Other
Bath <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	Railings? <input type="checkbox"/> No <input type="checkbox"/> Yes: # <input type="checkbox"/> 1 <input type="checkbox"/> 2	Do you have throw rugs? <input type="checkbox"/> Yes <input type="checkbox"/> No
Bedroom: <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	Stairs inside home: <input type="checkbox"/> Yes <input type="checkbox"/> No	Have history of falls? <input type="checkbox"/> Yes <input type="checkbox"/> No
Laundry: <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	Railings? <input type="checkbox"/> No <input type="checkbox"/> Yes: # <input type="checkbox"/> 1 <input type="checkbox"/> 2	

Please answer the following to help us know if you have other issues you may need help with:

Any financial barriers that might affect your care: No Yes: Explain: _____

Any Cultural or Religious beliefs or wishes that might affect care? No Yes: Explain: _____

What is the easiest way for you to learn? Discussion Reading Seeing (pictures) Practice

Anyone besides you that we should be teaching: No Yes: Explain: _____

Is it ok to share medical information with family/friends? Yes No: Exceptions: _____

Phone number where it is ok to leave messages: _____



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Pain History

Do you have Pain? No Yes If No: Skip to Goal Section

If Yes: Please complete the following questions:

Use the following scale to rate the level of your pain by selecting the appropriate number:

Pain level: NOW _____ BEST _____ (since onset) WORST _____ (since onset)

None Mild Moderate Severe Worst Possible

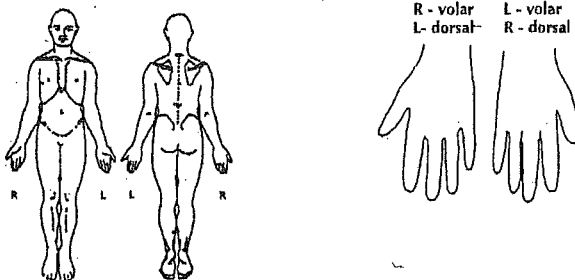
0 1 2 3 4 5 6 7 8 9 10

Please answer the following to describe your pain:

Type of pain: <input type="checkbox"/> Dull <input type="checkbox"/> Sharp <input type="checkbox"/> Burning <input type="checkbox"/> Other	Is Pain worse in: <input type="checkbox"/> Morning <input type="checkbox"/> End of Day <input type="checkbox"/> Night
Is the pain: <input type="checkbox"/> Constant <input type="checkbox"/> Comes and Goes	Does it wake you from sleep: <input type="checkbox"/> Yes <input type="checkbox"/> No
Any: <input type="checkbox"/> Numbness <input type="checkbox"/> Tingling <input type="checkbox"/> Pins and Needles Where?	Does it change if you: <input type="checkbox"/> Cough <input type="checkbox"/> Sneeze <input type="checkbox"/> Have a Bowel Movement

Is your pain/symptoms: Stable Improving Worsening

Please indicate on the body below where you currently experience pain/symptoms:



What makes your pain worse? _____

What makes your pain better? _____

Functional Status and Goals

Please list three to five activities that you now have difficulty doing or are unable to do. Pick ones that are important to you:

My Goal(s) from therapy is/are: (Please indicate specific activities you would like to improve or work on)

Patient Signature: _____ Date: _____

Table 1

Distribution of Responses for the Standard and Experimental Conditions in Each Recommendation Area

Recommendation area	Not implemented	Some of the time	Most of the time	All of the time	Total
Bathing					
Standard	2	4	6	7	19
Experimental	0	3	10	2	15
Grooming					
Standard	4	2	8	8	22
Experimental	1	6	8	3	18
Dressing					
Standard	9	2	9	3	23
Experimental	2	5	4	6	17
Cooking					
Standard	2	0	14	7	23
Experimental	0	2	8	8	18
Hand activities					
Standard	3	3	12	4	22
Experimental	2	3	9	3	17

Table 2

Results of the Pearson Chi Square Test for the Degree to which Recommendations were Implemented into the Home

Recommendation areas	N	df	Chi Square values	p-values (2-tailed)
Bathing	34	3	5.527	0.137
Grooming	40	3	5.730	0.126
Dressing	40	3	7.942	0.047*
Cooking	41	3	5.170	0.160
Hand activities	39	3	0.133	0.988

* statistically significant ($p \leq 0.05$)

Table 3

Results of the Spearman Correlation Coefficients for the Relationship Between Pain and Recommendations Implemented into the Home

Recommendation areas	N	Spearman correlations	Standard error	p-values (2-tailed)
Bathing	34	0.105	0.196	0.555
Grooming	40	-0.237	0.131	0.141
Dressing	40	0.009	0.154	0.957
Cooking	41	-0.194	0.140	0.224
Hand Activities	39	0.015	0.170	0.928

Table 4

Results of Cramer's V Effect Size Statistics for Implementation of Recommendations into the Home

Recommendation areas	N	Cramer's V	p-values (2-tailed)
Bathing	34	0.403	0.137
Grooming	40	0.378	0.126
Dressing	40	0.446	0.047
Cooking	41	0.355	0.160
Hand Activities	39	0.058	0.988